

Prof. Bell points out the danger which consequently exists of the formation of a distinct deaf-mute variety of mankind.

All this is clearly brought out in Prof. Bell's memoir; but Mr. Packard goes so far as to state that Mr. Bell's statistics appear to "almost demonstrate the fact of the transmission of characters acquired during the life-time of the individual," and also says that "deaf-mutes already appear to breed true to their incipient strain or variety, whether congenitally deaf or rendered so by disease during the life-time of either or both parents." (The italics are ours). We are thus left in no doubt as to Mr. Packard's interpretation of Mr. Bell's researches; but an attempt on our own part to find in Mr. Bell's pages the particular statistics or remarks which may be regarded as all but demonstrating the inheritance of acquired characters has, remarkably enough, been completely unsuccessful. Mr. Bell's conclusions lend no support to such a view. So far as they bear upon the present subject, they are briefly as follows: (1) That the great factor in determining the production of deaf-muteness in offspring is the existence of a hereditary taint in the direction of deaf-muteness in one or both branches of the family. (2) That this hereditary taint is not the less potent in its effects if it fails to manifest itself in the actual parents of the deaf-mute. (3) That "non-congenital deafness, if sporadic, is little likely to be inherited."

It would thus appear, both from Chilton's presentation of the facts, and from the failure of Packard's appeal to analogy, that—often as the contrary opinion has been urged—the peculiarities of cavernicolous animals do not lend any particular degree of support to the Lamarckian principles of evolution.

W. G.

PROPOSED BALLOON VOYAGE TO THE POLE.

DURING the last century many expeditions to the North Pole have been undertaken, but with no result so far as reaching it is concerned. Baron Norden-skiöld, the great Arctic explorer, has made four expeditions to Spitzbergen, and two to Nova Zemlia and Greenland, besides having taken part in the celebrated voyage of the *Vega*. In all explorations both he and others have found the icebergs the chief obstacle; and it may be said that Arctic explorers are now almost all unanimously convinced that the Pole can never be reached in steamer or sledge. Attempts on foot have likewise failed, for the distance of about ten miles has never been exceeded, owing to the great difficulties and dangers.

Notwithstanding these facts, Dr. Nansen, the celebrated Norwegian explorer, attempted yet another way, and instead of cutting a path through the ice, he has allowed himself to be carried polewards by a northerly current. This took place a year and eight months ago, and he has not been heard of since.

Quite recently, at the Royal Academy of Science, Stockholm, an even more perilous project was proposed by M. Andrée, a Swedish engineer. M. Andrée proposes making the expedition in a balloon. The project is not a new one, but it has never been seriously discussed by Arctic explorers. M. Andrée, however, has had much experience in polar regions, having spent the winter of 1882-83 in the far north, and also taken part in the Swedish Meteorological Expedition, which lasted a year. He has also proved himself to be a dauntless aeronaut, his most interesting voyage being one from Gothenburg to the Isle of Gothland, in which he had to cross part of the Baltic. Everything in connection with this proposed expedition has been minutely studied and discussed; and infinite pains have been taken to solve all difficulties.

The balloon would require a double outer covering, and a volume of 6500 cubic yards. The ascensional

power thus obtained would be sufficiently great to carry three persons, furnished with provisions for four months, besides allowing for the car being fitted up with necessary instruments for observation, life-buoys, and Berton's collapsible boats. The car could be suspended in such a way as to allow of instant detachment in case of a descent into the sea. The entire weight of the balloon must not exceed about three tons. In the instance of Henri Giffard's captive balloon, exhibited in 1878, and which weighed about six tons, it only required newly inflating after a year's use. According to Graham's observations, a balloon measuring $8\frac{3}{4}$ yards in diameter can be made sufficiently air-tight so as to suffer, per month, merely a loss of $13\frac{1}{2}$ lbs. of its ascensional force. M. Andrée, however, hopes to produce an absolutely impermeable covering.

The balloon, being protected from the wind by a wooden enclosure, would be inflated as far north as possible, by means of hydrogen compressed in cylinders. This once accomplished, it would begin to ascend. To a certain extent it might be steered by means of a sail and several guide-ropes, which, dragging on the earth, form as it were a brake. The ropes, however, would have to be of special composition, in order to produce the same effect in water. The hindrance thus caused to the flight of the balloon, together with the pressure of the wind, would allow the use of a sail. The flight then might reach an angle of 40° away from the wind direction. This steering apparatus, invented by M. Andrée, has often been used by him in his aerial voyages.

Besides the guide-ropes, heavy lines, on which would be placed numbered metal plates, would be attached to the car; these would serve as ballast. In case of a lowering of temperature, and a consequent descent of the balloon, it could be lightened by throwing off these plates, which, if found, would, to a certain extent, show the course taken by the explorers.

Spitzbergen has been chosen as the starting-point, for this island is almost always clear of ice by the middle of June. The departure would take place in July, on a clear day, with a southerly wind. At Spitzbergen the average rate of wind per second is $10\frac{1}{2}$ yards; the guide-ropes would cause a hindrance of about $2\frac{3}{4}$ yards per second, therefore the average rate of balloon would be nearly 8 yards per second, which is about 16 miles an hour. At this rate the Pole should be reached in 43 hours.

The summer is in all respects the most suitable time for an aeronautic voyage in Spitzbergen. The lowest temperature observed at Cape Thorsden in July, 1883, was $+0^\circ 8$ C., and the highest $+11^\circ 6$ C. The movements of the balloon would therefore be very regular. Besides this, there are practically no storms, and the fall of snow in June and July is both slight and rare.

M. Andrée's project has been highly approved of by the most experienced Arctic explorers. Baron Norden-skiöld has declared himself in favour of it, and M. Eikholm, chief of the Swedish Meteorological Expedition to Spitzbergen in 1882-83, states that the conditions of the Arctic regions are most favourable for this voyage. He thinks, moreover, that in the future the balloon will be the principal means of exploring that part of the world.

For many of the above details, we are indebted to an article in the *Revue Scientifique*, by M. Charles Rabot.

W.

THOMAS HENRY HUXLEY.

WE regret to announce that, after an illness extending back to last March, and relieved only by two or three brief periods of improving health, Prof. Huxley passed peacefully into the silence of death on Saturday afternoon.

So long ago as 1874, a notice of the life and work of Prof. Huxley was included in our "Scientific Worthies" (vol. ix. p. 257), and Dr. Ernst Haeckel added to it an appreciative notice of his biological labours. These twenty-year-old publications render it unnecessary that any extensive reference to the subject-matter of them should be given now, and, moreover, the chief details of his life are well known.

Huxley was born at Ealing in 1825. His scientific training began in the medical school attached to Charing Cross Hospital, which he entered in 1842. Four years later he joined the medical service of the Royal Navy, and proceeded to Haslar Hospital; from there he was selected to occupy the post of Assistant-Surgeon to H.M.S. *Rattlesnake*, then about to proceed on a surveying voyage in the Southern Seas. The ship sailed from England in the winter of 1846, and returned to England in 1850, after surveying the inner route between the Barrier Reef and the East Coast of Australia and New Guinea. During this period, Huxley sent home several papers, some of which were published in the *Philosophical Transactions* of the Royal Society. His first important paper, "On the Anatomy and Affinities of the Medusæ," was published in 1849. His communications, and the evience of ability which they furnished, led to his election into the Royal Society in 1851.

In 1854, Huxley succeeded his friend Edward Forbes as Palæontologist and Lecturer on Natural History at the Royal School of Mines, a post which he held until his retirement in 1885. He was a great teacher, and the high reputation of the School, now combined with the Royal College of Science, is largely due to his great influence. At the request of the Lords of the Committee of Council on Education, he continued to act as Honorary Dean of the School, and at death he still retained that post. He also agreed to be responsible for the general direction of the biological instruction in the School, so that his place as Professor of Biology has never been filled up.

Huxley was twice chosen Fullerian Professor of Physiology to the Royal Institution, the first time in 1854. In the same year he was appointed Examiner in Physiology and Comparative Anatomy to the University of London. Other posts and honours were crowded upon him. In 1858 he delivered the Croonian Lecture of the Royal Society, when he chose for his subject the "Theory of the Vertebrate Skull." From 1863 to 1869 he held the post of Hunterian Professor at the Royal College of Surgeons. In 1862 he was President of the Biological Section at the Cambridge meeting of the British Association, and eight years later held the Presidency of the Association at the Liverpool meeting. In 1869 and 1870 he was President of the Geological and Ethnological Societies, and in 1872 was elected Lord Rector of Aberdeen University for three years. As might be expected, Prof. Huxley held strong and well-defined views on the subject of education. He was a man who at all times had a keen sense of public duty, and it was this which induced him to seek election on the first London School Board in 1870. Ill-health compelled him to retire from that post in 1872, but during his period of service as chairman of the Education Committee he did much to mould the scheme of education adopted in the Board Schools.

He was elected Secretary of the Royal Society in 1873, and ten years later was called to the highest honorary position which an English scientific man can fill, the presidency of that Society. During the absence of the late Prof. Sir Wyville Thomson with the *Challenger* Expedition, Huxley, in 1875 and 1876, took his place as Professor of Natural History in the University of Edinburgh. From 1881 to 1885 he acted as Inspector of Salmon Fisheries. But this and all his other official

posts he resigned in 1885, shortly after which he removed to Eastbourne.

In 1892, more than six years after his retirement, the dignity of Privy Councillor was conferred upon him. The Copley Medal of the Royal Society was awarded to him in 1888, the Royal Medal having been received by him in 1852; and in December last he received the Darwin Medal, the two previous recipients being Dr. A. R. Wallace and Sir Joseph Hooker. His honorary degrees were:—D.C.L. (Oxford); LL.D. (Cambridge, Edinburgh, and Dublin); M.D. (Würzburg); Ph.D. (Breslau). The King of Sweden created him Knight of the Polar Star, and he was elected into most foreign Societies and Academies of Science of note. He was a Correspondant of the Paris Académie des Sciences (Section of Anatomy and Zoology), and Corresponding Member of the St. Petersburg Académie Impériale des Sciences, the Akademie der Wissenschaften, of Berlin and of Munich, the Svenska Vetenskaps-Akademie, Stockholm, the Halle Akademie der Naturforscher, the Academies of Natural Sciences of Philadelphia, Boston and Buffalo, the Göttingen Gesellschaft der Wissenschaften, the Paris Société d'Anthropologie, and the Naturforschende Gessellschaft at Frankfurt-a-M. He was Honorary Member of the Royal Irish Academy, the Accademia dei Lincei at Rome, the Brussels Académie de Médecine, the Institut Egyptien at Alexandria, the Batavia Genootschap van Kunsten en Wetenschappen, the American Academy of Arts and Sciences, National Academy of Sciences, and the Amsterdam Akademie van Wetenschappen. He was also Foreign Member of the Brussels Académie des Sciences, the Haarlem Maatschappij der Wetenschappen, the Philadelphia Academy of Natural Science, and the Società Italiana delle Scienze.

How far-seeing Huxley was, with regard to our present scientific needs, may be gathered from his address when he retired from the presidency of the Royal Society. He saw that scientific literature would have to be organised before it could be fully utilised. His words were: "We are in the case of Tarpeia, who opened the gates of the Roman citadel to the Sabines, and was crushed under the weight of the reward bestowed upon her. It has become impossible for any man to keep pace with the progress of the whole of any important branch of science. . . . It looks as if the scientific, like other revolutions, meant to devour its own children; as if the growth of science tended to overwhelm its votaries; as if the man of science of the future were condemned to diminish into a narrower and narrower specialist as time goes on. . . . It appears to me that the only defence against this tendency to the degeneration of scientific workers, lies in the organisation and extension of scientific education, in such a manner as to secure breadth of culture without superficiality; and on the other hand, depth and precision of knowledge without narrowness." Another point touched upon in the same address was the claims of science to a place in all systems of education. "We have a right," he said, "to claim that science shall be put upon the same footing as any other great subject of instruction, that it shall have an equal share in the schools, an equal share in the recognised qualification for degrees, and in University honours and rewards. It must be recognised that science, as intellectual discipline, is at least as important as literature, and that the scientific student must no longer be handicapped by a linguistic (I will not call it literary) burden, the equivalent of which is not imposed upon his classical compeer." To the expression of such views as these we owe the increased attention now given to scientific instruction in this country, though we have not yet reached the impartial stage to which science has a right.

It may, perhaps, be too early to fix Huxley's real place in Biology. Writing in these columns in 1874, the eminent German naturalist, Haeckel, ranked him among

the first zoologists in England, taking zoology in its widest and fullest signification. "When we consider," he remarked, "the long series of distinguished memoirs with which, during the last quarter of a century, Prof. Huxley has enriched zoological literature, we find that in each of the larger divisions of the animal kingdom we are indebted to him for important discoveries." From the lowest animals he gradually extended his investigation to the highest. In the Protozoa, he was the first to come to satisfactory conclusions concerning the nature of Thalassicolidae and Sphærozoida; and by his work on "Oceanic Hydrozoa," he greatly extended the knowledge of Zoophytes. His researches upon members of the important group of Tunicata are of great value, and many important advances in the morphology of the Mollusca and Arthropoda are due to him. Further, Huxley especially studied and advanced the knowledge of the comparative anatomy and classification of the Vertebrata. His "Lectures on the Elements of Comparative Anatomy," and his numerous monographs on living and extinct species, afford abundant evidence of what biological science owes to him.

Huxley's place as one who has largely influenced modern thought on many questions, is acknowledged by all to be a very high one. The profound and truly philosophical conceptions which guided him in his inquiries, always enabled him to distinguish the essential from the unessential. First among the subjects which owe their advancement to his support is the theory of biological evolution. When, in 1860, it became his duty as Professor at the Royal School of Mines to give a course of lectures to working men in the Jermyn Street Museum of Practical Geology, he selected for his subject "The Relation of Man to the Lower Animals." The questions arising out of this topic became the subject of warm controversy at the meeting of the British Association in that and subsequent years. The lectures were published in 1863, under the title "Evidence as to Man's Place in Nature," and excited great interest both in this country and abroad. In this and in other works he advanced the principles of the Darwinian theory, and worked out many important developments.

To again quote Haeckel: "Not only has the Evolution Theory received from Prof. Huxley a complete demonstration of its immense importance, not only has it been largely advanced by his valuable comparative researches, but its spread among the general public has been largely due to his well-known popular writings. In these he has accomplished the difficult task of rendering more fully and clearly intelligible to an educated public of very various ranks, the highest problems of philosophic biology. From the lowest to the highest organisms, he has elucidated the connecting law of development. In these several ways he has rendered science a service which must ever rank as one of the highest of his many and great scientific merits."

As a writer of English, Huxley has been unsurpassed in our time and generation. He has set a standard in scientific literature, both in clearness of exposition and in the most perfect handling of words, which it behoves his successors to closely follow. He aimed at writing clearly, and avoided the use of technical language whenever possible. As he remarks in the preface to the volume of "Collected Essays" containing his biological and geological addresses: "I have not been one of those fortunate persons who are able to regard a popular lecture as a mere *hors d'œuvre*, unworthy of being ranked among the serious efforts of a philosopher; and who keep their fame as scientific hierophants unsullied by attempts—at least, of the successful sort—to be understood of the people. On the contrary, I found that the task of putting the truths learned in the field, the laboratory and the museum, into language which, without bating a jot of scientific accuracy shall be generally intelligible, taxed such scien-

tific and literary abilities as I possessed to the uttermost; indeed, my experience has furnished me with no better corrective of the tendency to scholastic pedantry which besets all those who are absorbed in pursuits remote from the common ways of men, and become habituated to think and speak in the technical dialect of their own little world, as if there were no other."

This Journal especially loses in him one of its best friends. We are now in the second series of fifty volumes, and his was the hand that commenced both of them. His introduction to the fifty-first volume will be fresh in the minds of our readers, and it justified the position he had occupied since 1859, as the devoted apostle of the Darwinian theory. He was, moreover, not only a most valued contributor to our columns, but his advice on many points has been freely asked, given, and followed, during a quarter of a century.

Huxley's wonderful kindness to young men is very well known. He would discuss subjects with his students, and his perfect geniality put them entirely at their ease. Always ready to extend a helping hand, he assisted many to higher ranges than they could otherwise have attained, and by words of encouragement induced others to continue their ascent.

The objects which Huxley stated he had in mind from the commencement of his scientific career are these:—

"To promote the increase of natural knowledge and to forward the application of scientific methods of investigation to all the problems of life to the best of my ability, in the conviction which has grown with my growth and strengthened with my strength that there is no alleviation for the sufferings of mankind except veracity of thought and of action, and the resolute facing of the world as it is when the garment of make-believe by which pious hands have hidden its uglier features is stripped off. It is with this intent that I have subordinated any reasonable, or unreasonable, ambition for scientific fame, which I may have permitted myself to entertain, to other ends; to the popularisation of science; to the development and organisation of scientific education; to the endless series of battles and skirmishes over evolution; and to untiring opposition to that ecclesiastical spirit, that clericalism, which in England, as everywhere else, and to whatever denomination it may belong, is the deadly enemy of science. In striving for the attainment of these objects, I have been but one among many, and I shall be well content to be remembered, or even not remembered, as such."

How nobly he acted up to his principles we all know; how greatly the pursuit of his objects have benefited intellectual and material progress, we can only estimate.

In the preface of the fifth volume of his "Collected Essays," Huxley gives a quotation from Strauss's "Der alte und der neue Glaube," which describes so exactly the guiding principles of his life, that it is difficult to believe the lines were written by another hand nearly a quarter of a century ago. "For close upon forty years," wrote Strauss, "I have been writing with one purpose; from time to time I have fought for that which seemed to me the truth, perhaps still more, against that which I have thought error; and in this way I have reached, indeed overstepped, the threshold of old age. There every earnest man has to listen to the voice within: 'Give an account of thy stewardship, for thou mayest be no longer steward.' That I have been an unjust steward, my conscience does not bear witness. At times blundering, at times negligent, Heaven knows; but, on the whole, I have done that which I felt able and called upon to do; and I have done it without looking to the right or to the left; seeking no man's favour, fearing no man's disfavour."

Huxley leaves a wife and seven children—three sons and four daughters. They mourn the loss of a loving husband and father, and their affliction is shared by all who were fortunate enough to know him as a friend. But his loss will not only be felt by these; it affects the whole

intellectual world. Men will arise who, like him, will advance and extend scientific knowledge by research and exposition, but rarely will the qualities of the investigator and interpreter be combined with a more charming personality.

The funeral has been fixed to take place at Marylebone Cemetery this afternoon, at 2.30 o'clock.

NOTES.

AMONG the honours which Lord Rosebery recommended on leaving office, and which the Queen has approved, we notice that Dr. Robert Giffen, C.B., whose work in various departments of statistical science will be known to our readers, has become K.C.B., and that Prof. J. W. Judd has been appointed C.B. Mr. James Blyth, the well-known agriculturist, has received a baronetcy, Colonel V. D. Majendie, C.B., has been promoted to K.C.B., and Captain Lugard has been appointed C.B.

THE International Meteorological Committee, at its last meeting at Upsala, in August 1894, recommended that an International Conference of the same character as that of Munich in 1891, should be held at Paris about the middle of September, probably September 15, 1896. A circular has just been distributed among meteorologists, announcing that M. Mascart has undertaken to make the arrangements necessary for the meetings of the conference. Mr. R. H. Scott will be glad to receive, at the Meteorological Office, notes on any questions suitable for insertion in the programme for the conference. It is proposed that the definitive programme shall be prepared before the end of the present year 1895, in order to give meteorologists interested in the subjects proposed for discussion, time to formulate their views thereon.

THE death is announced of Prof. D. Kirkwood, for many years Professor of Mathematics in Indiana State University, and known for his investigations of the orbits of planets and comets.

AN influential committee has been formed in Paris, to collect funds for the erection of a monument to Francis Garnier, the explorer. The Treasurer of the Committee is M. J. Rueff, 43 rue Taitbout, Paris.

PROF. FUCHS has been elected a Correspondant of the Paris Academy of Sciences, in the Section of Geometry; Dr. Nansen has been elected a Correspondant of the Section of Geography and Navigation, and Dr. Laveran a Correspondant of the Section of Medicine and Surgery.

PROF. WILD has formally announced the resignation of his office at St. Petersburg as from September 13. His future residence will be at Zurich, and he requests that papers and books hitherto addressed to him at St. Petersburg, should be sent to his new address.

THE subject of the essays for the Howard Medal of the Royal Statistical Society, to be awarded in 1896, with £20 as heretofore, is "School Hygiene, in its Mental, Moral, and Physical Aspects." Essays should be sent in on or before June 30, 1896.

PROF. C. LLOYD MORGAN has accepted an invitation to deliver four lectures in the Columbia University Biological Course next winter. His subject will be "Some Habits and Instincts of Birds." Mr. Frank M. Chapman, of the American Museum of Natural History, will also give four lectures upon birds, from the zoologist's standpoint.

THE American Museum Expedition of 1895 has already completed the exploration of the Uinta basin fossil fauna, and

established the fact that, like the *Phosphorites* of France, it is completely transitional between the Eocene and Miocene. The party is now passing north to explore Brown's Park on the eastern base of the Uinta Mountains, an ancient lake basin which has been long known but hitherto unexplored for fossils.

THE Executive of the Midland Union of Naturalists at their annual meeting, held on Monday last at Oxford, awarded to Mr. Walter E. Collinge, Assistant-Lecturer in Zoology and Comparative Anatomy, Mason College, Birmingham, the "Darwin Medal" for his recent researches on the cranial nerves and sensory canal system of fishes.

MR. GEORGE S. DAVIS, who, since January 1885, has at a very heavy loss maintained the "Index Medicus," announces he will be obliged to discontinue that very useful publication, owing to insufficient support. It would hardly be to the credit of medical societies, and scientific workers generally, if this indispensable monthly index is allowed to come to an end for want of something like £400 a year.

THE fortieth annual exhibition of the Royal Photographic Society will be inaugurated on Saturday, September 28, by a private view, followed in the evening by a conversation. The exhibition will remain open daily (Sundays excepted) from September 30 until November 14. Medals will be placed at the disposal of judges for the artistic, scientific, and technical excellence of photographs, lantern slides, and transparencies, and for apparatus. The judges for the technical section are Captain W. de W. Abney, Mr. Chapman Jones, and Mr. Andrew Pringle.

AN International Exhibition of Hygiene, organised under the direction of M. Brouardel, was opened at Paris on Thursday last. The exhibits are divided into five groups, referring respectively to (1) the hygiene of private houses; (2) city hygiene; (3) the prophylactics of zymotic diseases, demography, sanitary statistics, &c.; (4) the hygiene of childhood, including alimentary hygiene, questions of clothing, and physical exercises; (5) industrial and professional hygiene.

THE *Weekly Weather Report* of the 29th ult. shows that the rainfall for the first half of this year is much below the average in all districts except the north-east of England. The deficiency varies from 2.5 inches in the east of Scotland, to 5 inches in the south-west of England, but in the west of Scotland the deficiency amounts to 12 inches. Some heavy amounts have, however, been measured recently; at Churchstoke, Montgomery, the abnormally large fall of 4.83 inches was recorded on the 26th ult.

A FEW days ago, the Lord Mayor of Liverpool, on behalf of the Museum Committee of the Corporation (of which Sir William B. Forwood is chairman), opened in the Public Museum, in presence of a numerous assembly, a large new gallery exclusively devoted to ethnography. An interesting account of the origin and history of the collection, and of the method of its arrangement, was given by Dr. H. O. Forbes, the Director of Museums. The African, Papuan, and New Zealand sections are especially rich, while those of Mexico, Peru, and Patagonia contain some very rare exhibits of exceptional value.

AT the annual general meeting of the Society of Arts, the following gentlemen were elected Vice-Presidents:—Sir Edward Birkbeck, Mr. B. Francis Cobb, the Hon. Sir Charles W. Fremantle, Sir Douglas Galton, and Prof. W. C. Roberts-Austen. To fill the places vacated by retiring members of Council, there were elected, at the same meeting, Sir Stuart Colvin Bayley, Major-General Sir Owen Tudor Burne, Mr. R. Brudenell Carter, and Dr. Francis Elgar. Sir Frederick Bramwell was elected Treasurer of the Society.